

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of synchronizing ~~the~~ a carrier frequency of a mobile station with ~~the~~ a carrier frequency of a base station in a cellular mobile communication system, the synchronizing including:

~~a reference frequency oscillator being re-adjusted by means of a final controlling element, characterized in that the~~ determining and/or predicting a frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station; and the
determining and/or predicting, separately from determining and/or predicting the frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station, a frequency variation that occurs when there is a change in the location of the mobile station relative to the base station; and ~~are determined and/or predicted separately, and in that,~~

when a large frequency variation is determined and/or expected ~~predicted,~~ synchronizing, using an AFC algorithm, the carrier frequency of the mobile station is ~~synchronized with the carrier frequency of the base station, by means of an AFC algorithm, more frequently than is the case when a small frequency variation is determined and/or expected~~ predicted.

2. (Currently Amended) A method as claimed in claim 1, ~~characterized in that~~ comprising making a distinction is made in the mobile station between whether the frequency variation is due to a change in temperature and/or to a change in location, and the making including making a distinction is made in particular between the proportion of the frequency

variation that is due to a change in temperature and the proportion that is due to a change in location.

3. (Currently Amended) A method as claimed in claim 2, ~~characterized in that the~~ wherein making the distinction is also made by ~~includes~~ determining whether the course followed by the frequency variation is steady or abrupt.

4. (Currently Amended) A method as claimed in claim 1, ~~characterized in that comprising processing together the frequency variations that result from a change in temperature and/or a change in location, the processing including detecting are processed together in such a way that canceling out by superimposition is detected.~~

5. (Currently Amended) A method as claimed in claim 1, ~~characterized in that comprising obtaining in the mobile station a measured variable from which conclusions are drawn as to the absolute temperature of the mobile station is obtained in the mobile station.~~

6. (Currently Amended) A method as claimed in claim 5, ~~characterized in that the~~ comprising determining a time-based temperature gradient is determined from measured variables.

7. (Currently Amended) A method as claimed in claim 5, ~~characterized in that comprising storing in the mobile station a curve for the change in frequency variation as a function of temperature, which curve is characteristic of the mobile station, is stored in the mobile station~~ storing including storing the curve as a table and such that a value corresponding to an expected change in frequency can be read out from this table.

8. (Currently Amended) A method as claimed in claim 7, ~~characterized in that also stored in the values~~ comprising storing in the table is an exactness indicator that

indicates how high ~~the~~ a probability is of the value stored in the table matching ~~the~~ an actual current shape of the characteristic curve.

9. (Currently Amended) A method as claimed in claim 7, ~~characterized in that comprising, when manufacturing the mobile station is being manufactured, preloading the table is preloaded by measuring certain plotting points on the characteristic curve, or by shifting a typical, known characteristic curve in translation by an additive value that has been obtained by measuring a single plotting point.~~

10. (Currently Amended) A method as claimed in claim 8, ~~characterized in that comprising, when manufacturing the mobile station is being manufactured, preloading the table is preloaded with the values for a typical, known characteristic curve without any measurements.~~

11. (Currently Amended) A method as claimed in claim 7, ~~characterized in that comprising determining or updating the individual characteristic curve is determined or updated by teach-in processes during the operation of the mobile station.~~

12. (Currently Amended) A method as claimed in claim 8, ~~characterized in that wherein values of the table that are preloaded at the time of manufacture have a lower exactness indicator and values measured when the a standard of reception is good have a high exactness indicator, the method comprising replacing and values having a low exactness indicator are replaced by values having a high exactness indicator.~~

13. (Currently Amended) A method as claimed in claim 1, ~~characterized in that comprising storing in the mobile station a heating-up curve that is typical of the mobile station and that represents operation-related changes in temperature with time, the storing including storing the heating-up curve is stored in the mobile station as a table or as parameters~~

of ~~the~~an exponential function of the heating-up curve, from which an expected change in temperature can be estimated in advance.

14. (Currently Amended) A method as claimed in claim 13, ~~characterized in that the change in frequency is estimated wherein determining and/or predicting the frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station includes estimating in advance the frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station by correlating the heating-up curve with the~~a characteristic curve.

15. (Currently Amended) A method as claimed in claim 1, ~~characterized in that comprising identifying in advance critical states that affect temperature are identified in advance, and the change in wherein determining and/or predicting the frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station includes estimating frequency to be expected can be estimated variations based on the identified critical states.~~

16. (Currently Amended) A method as claimed in claim 1, ~~characterized in that, wherein determining and/or predicting the frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station includes estimating a temperature-related frequency error before any measurement of the frequency error, an estimate is made of the temperature-related frequency error that can be expected.~~

17. (Currently Amended) A method as claimed in claim 1, ~~characterized in that comprising, when measurements of the frequency variation are not possible due to poor reception conditions, estimating at the temperature-related frequency error that can be expected is estimated and is taken taking into account in the control process the temperature-related frequency error during the synchronizing.~~

18. (Currently Amended) A method as claimed in claim 1, ~~characterized in that the current~~ wherein determining and/or predicting the frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station includes, before measuring actual temperature changes or frequency variation, estimating the change in temperature to be caused by a mode of operation of the mobile station, and particularly the current ~~wherein estimating the change in temperature to be caused by the mode of operation includes estimating the change in temperature to be caused by~~ transmitted power and/or, in the case of a TDMA-based mobile station, the number of time slots occupied in the a transmitting mode, are included in the processing for the estimation in advance of the change in temperature or frequency variation.

19. (Currently Amended) A method as claimed in claim 1, ~~characterized in that the~~ comprising determining in advance a probability of a an imminent change jump in frequency which requires controlling action to be taken is determined in advance, for which purpose the following critical states of change of location are determined ~~the determining including:~~

"movement within the infrastructure";

"determining the probability of imminent travel past and below the base station";

and

"determining the probability of an imminent change of cell" cells.

20. (Currently Amended) A method as claimed in claim 19, ~~characterized in that the information "movement within the infrastructure" is obtained in the~~ wherein determining the probability of imminent travel past and below the base station includes:

determining the probability in an idle mode from a change in the a reception time of arrival (TOA) and/or from the a received power on the a reception frequency, with the and

determining the probability in a dedicated mode from a change in the a transmission timing advance (TA) being used in addition in the dedicated mode and from a change in a reception time of arrival and/or from a received power on a reception frequency.

21. (Currently Amended) A method as claimed in claim 19, ~~characterized in that the information~~ “wherein determining the probability of imminent travel past and below the base station” is obtained ~~includes:~~

~~determining the probability in the an idle mode from the fact of the~~ based on a reception time of arrival (TOA) approaching a minimum and/or the fact of the ~~a~~ received power on the a reception frequency exceeding a given threshold level, with the fact of the

~~determining the probability in a dedicated mode based on a transmission timing advance (TA) approaching a minimum being used in addition in the dedicated mode, based on a reception time of arrival approaching a minimum and/or a received power on a reception frequency exceeding a threshold level.~~

22. (Currently Amended) A method as claimed in claim 19, ~~characterized in that the information~~ “wherein determining the probability of an imminent change of cell” is obtained ~~includes:~~

~~determining the probability in an in the an idle mode from the a power measured in the adjacent cells, with the and~~

~~determining the probability in a dedicated mode from signaling to initiate the a change of cell being used in addition in the dedicated mode and from a power measured in adjacent cells.~~

23. (Currently Amended) A method as claimed in claim 1, ~~characterized in that the~~ comprising:

~~measuring~~ current reception conditions, and particularly the including ~~received field strength and/or the a signal-to-noise ratio of the a received signal, are measured and~~

~~the deriving, from the measuring, control parameters, such as the including a length of the an AFC control interval, the a conversion by the an AFC final controlling element, and the an exactness indicator for the table are derived from the results of the measurement.~~

24. (Currently Amended) A method as claimed in claim 1, ~~characterized in that wherein~~ the AFC algorithm adjusts ~~the a~~ length of ~~the~~ AFC measuring intervals as a function of ~~the a~~ size of the past and expected ~~change~~ changes in frequency, and/or when critical states of change of location and/or critical states that affect temperature are predicted.

25. (Currently Amended) A method as claimed in claim 1, ~~characterized in that wherein~~ the AFC algorithm adjusts ~~the a~~ length of ~~the an~~ AFC control interval as a function of ~~the a~~ size of the past and expected ~~change~~ changes in frequency, and/or when critical states of change of location and/or critical states that affect temperature are predicted, and/or when the reception conditions are good.

26. (Currently Amended) A method as claimed in claim 1, ~~characterized in that wherein~~ the AFC algorithm adjusts ~~the a~~ frequency conversion by ~~the a~~ AFC final controlling element as a function of ~~the a~~ size of the past and expected ~~change~~ changes in frequency, and/or when critical states of change of location and/or critical states that affect temperature are predicted, and/or when the reception conditions are good.

27. (Currently Amended) A method as claimed in claim 1, ~~characterized in that wherein~~ the AFC algorithm adjusts ~~the AFC's a~~ memory of measured values as a function of ~~the a~~ size of the past and expected ~~change~~ changes in frequency, and/or when critical states of change of location and/or critical states that affect temperature are predicted, and/or when the reception conditions are good.

28. (Currently Amended) ~~An arrangement for performing the~~ A method as claimed in claim 1, ~~characterized in that the~~ wherein the synchronizing includes re-adjusting a reference-frequency oscillator (4) ~~used is one that~~ has no temperature-compensating circuitry and that has an individual characteristic curve having a maximum frequency variation from ~~the a~~ nominal frequency of more than +/- 3 ppm in ~~the an~~ operating temperature range.

29. (Currently Amended) ~~An arrangement~~ A method as claimed in claim 28, ~~comprising for performing the method, characterized in that a temperature sensor (5) is provided that measures the~~ measuring a temperature of the reference-frequency oscillator (4) using a temperature sensor.

30. (Currently Amended) A mobile station, comprising: with
a reference-frequency oscillator configured to provide a carrier signal with a carrier frequency; and ~~being re-adjusted by means of~~

~~a final-controlling element, characterized in that the~~ configured to re-adjust the reference-frequency oscillator and synchronize the carrier frequency of the reference-frequency oscillator with a carrier frequency of a base station, the controlling element including:

means for determining and/or predicting a frequency variation that occurs in the mobile station due to a change in the temperature of the mobile station and the ~~separately from determining and/or predicting a frequency variation that occurs when there is a change in the location of the mobile station relative to the base station; and are determined and/or predicted separately, and in that,~~

synchronizing means for synchronizing the carrier frequency of the reference-frequency oscillator with a carrier frequency of a base station using an AFC algorithm, the synchronizing means synchronizing the carrier frequency of the reference-frequency oscillator with a carrier frequency of a base station more frequently when a large frequency variation is determined and/or expected, the carrier frequency of the mobile station is synchronized with the carrier frequency of the base station, by means of an AFC algorithm, more frequently predicted than is the case when a small frequency variation is determined and/or expected ~~predicted.~~

31. (Currently Amended) A microprocessor for a mobile station, the microprocessor ~~is provided comprising:~~

~~means for controlling a reference frequency oscillator characterized in that the microprocessor is provided for determining and/or predicting separately the~~ a frequency

variation that occurs in the mobile station due to a change in the temperature of the mobile station and ~~the a~~ frequency variation that occurs when there is a change in the location of the mobile station relative to ~~the a~~ base station and ~~in that~~,

synchronizing means for synchronizing a carrier frequency of a reference-frequency oscillator with a carrier frequency of the base station using an AFC algorithm, the synchronizing means synchronizing the carrier frequency of the reference-frequency oscillator with a carrier frequency of a base station more frequently when a large frequency variation is determined and/or expected, the microprocessor is provided for synchronizing the carrier frequency of the mobile station with the carrier frequency of the base station by means of an AFC algorithm, more frequently predicted than is the case when a small frequency variation is determined and/or expected predicted.

32. (New) A method as claimed in claim 1 wherein the synchronizing includes re-adjusting a reference-frequency oscillator using a controlling element.

33. (New) A mobile station as claimed in claim 30, wherein the controlling element includes means for making a distinction in the mobile station between whether the frequency variation is due to a change in temperature or to a change in location, including making a distinction between the proportion of the frequency variation that is due to a change in temperature and the proportion that is due to a change in location.

34. (New) A mobile station as claimed in claim 30, wherein the controlling element includes means for processing together the frequency variations that result from a change in temperature and/or a change in location, the processing including detecting canceling out by superimposition.

35. (New) A mobile station as claimed in claim 30, wherein the controlling element includes means for storing in a memory of the mobile station a curve for the frequency variation as a function of temperature, which curve is characteristic of the mobile station, the

means for storing including means for storing the curve as a table such that a value corresponding to an expected change in frequency can be read out from this table.

36. (New) A microprocessor as claimed in claim 31, comprising means for making a distinction in the mobile station between whether the frequency variation is due to a change in temperature or to a change in location, including making a distinction between the proportion of the frequency variation that is due to a change in temperature and the proportion that is due to a change in location.

37. (New) A microprocessor as claimed in claim 31, comprising means for processing together the frequency variations that result from a change in temperature and/or a change in location, the processing including detecting canceling out by superimposition.

38. (New) A microprocessor as claimed in claim 31, comprising means for storing in a memory of the mobile station a curve for the frequency variation as a function of temperature, which curve is characteristic of the mobile station, the means for storing including means for storing the curve as a table such that a value corresponding to an expected change in frequency can be read out from this table.